

1       1. A method comprising:  
2                 exposing an implanted wafer to acoustic energy to  
3 activate the implanted species.

1       2. The method of claim 1 including exposing an  
2 implanted wafer to acoustic energy to activate the  
3 implanted species using a mechanical vibration source.

1       3. The method of claim 2 including using a  
2 piezoelectric generator.

1       4. The method of claim 1 including generating  
2 acoustic energy using a laser beam.

1       5. The method of claim 1 including exposing the  
2 implanted wafer to acoustic energy while heating the wafer.

1       6. The method of claim 5 wherein heating the wafer  
2 includes exposing the wafer to a laser beam.

1       7. The method of claim 6 wherein exposing the wafer  
2 to a laser beam includes exposing the wafer to an infrared  
3 laser beam.

1       8. The method of claim 5 wherein heating the wafer  
2 includes exposing the wafer to rapid thermal anneal lamps.

1       9. The method of claim 1 including exposing the  
2 wafer to two laser beams, said laser beams having different  
3 energy, one of said laser beams to heat said wafer and the  
4 other of said laser beams to generate phonons.

1       10. The method of claim 1 including annealing the  
2 wafer after ion implantation and subsequently using  
3 acoustic energy to activate the implanted species by the  
4 generation of phonons.

1       11. A method comprising:  
2              implanting a semiconductor wafer; and  
3              activating the implanted species by mechanically  
4 perturbing said wafer.

1       12. The method of claim 11 including using a  
2 piezoelectric transducer to perturb said wafer.

1       13. The method of claim 12 including using a  
2 transducer mounted in a wafer holder to perturb said wafer.

1       14. The method of claim 11 including applying heat to  
2 said wafer.

1       15. The method of claim 14 including applying heat  
2 using rapid thermal annealing lamps.

1       16. The method of claim 14 including applying heat  
2 using a laser.

1       17. The method of claim 16 including applying heat  
2 using an infrared laser.

1       18. The method of claim 16 including mechanically  
2 perturbing said wafer at the same time said wafer is being  
3 heated.

1       19. The method of claim 18 including mechanically  
2 perturbing said wafer in a rapid thermal annealing furnace.

1       20. The method of claim 14 including heating said  
2 wafer and then mechanically perturbing said wafer.

1       21. A method comprising:  
2              exposing an implanted semiconductor wafer to a  
3 first laser at a first energy; and  
4              exposing said implanted semiconductor wafer to a  
5 second laser at a second energy lower than said first  
6 energy.

1       22. The method of claim 21 including exposing said  
2 semiconductor wafer to said second laser to generate  
3 acoustical energy.

1           23. The method of claim 22 including generating  
2 acoustical energy to activate implanted species.

1           24. The method of claim 21 including exposing said  
2 semiconductor wafer to said first laser that is a infrared  
3 laser.

1           25. The method of claim 21 including heating said  
2 wafer to activate said species.